DOCUMENT RESUME

ED 168 714 PS 010 482

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TITLE Home Environment and Learning: A Quantitative Synthesis.
INSTITUTION Illinois Univ., Chicago. Chicago Circle Campus.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.; National Science Foundation, Washington, D.C.
PUB DATE Apr 79
GRANT NIE-6-78-0090; NSF-78-17374
NOTE 33p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, California, April 8-12, 1979); Tables have been filmed from best available copy

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Correlation; Ecological Factors; Elementary School Students; *Family Environment; *Family Influence; *Learning; Secondary School Students; Social Influences; Socioeconomic Status; *Statistical Analysis; *Statistical Studies
IDENTIFIERS *Research Synthesis

ABSTRACT

The purpose of this analysis is to provide an estimate of the mean correlation of home environment measures with learning measures across studies and to indicate sample and study characteristics associated with different magnitudes of correlation. University of Chicago studies of behavioral processes and British investigations of parental experiences and attitudes and material conditions in the home were analyzed to determine if the studies differ in predictive validity. From a systematic search of educational, psychological, and sociological literature, 18 studies of 5,831 first through twelfth grade students in eight countries over a 19-year period were selected. Eight items of information were recorded for each correlation: the size, age, sex, and socioeconomic status of the sample; the home assessment and learning measures employed; Chicago or British research school; and type of correlation. It was found that correlations of intelligence, motivation, and achievement with indexes of parent stimulation of the student in the home are considerably higher than those with indexes of socioeconomic status (SES). Specifically, the median of 92 simple correlations of home environment and learning is .37 (with a range of .02 to .82) and the median of 62 multiple-regression-weighted composites is .44 (range .23 to .81). Jackknifed regression estimates indicate that the gender and SES of the sample condition the sizes of the correlations and suggest priorities for future primary investigations. (Author/RH)

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Home Environment and Learning:
A Quantitative Synthesis*

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PS010482

*The authors thank Maurice J. Eash and Harriet Talmage of the University of Illinois at Chicago Circle for institutional support. The research presented in this article was also supported by the National Institute of Education (Grant No. NIE-6-78-0090) and the National Science Foundation (Grant No. NSF-78-17374); the points of view and opinions stated do not necessarily represent the official position or policy of either agency.

AERA SAN FRANCISCO 1979 7.04 (session #)

Abstract

From a systematic search of educational, psychological, and sociological literature, 18 studies of 5,831 school-aged students on the correlation of home environment and learning in eight countries over a 19-year period were selected. Correlations of intelligence, motivation, and achievement with indexes of parent stimulation of the student in the home are considerably higher than those with indexes of socio-economic status (SES); specifically the medians (and ranges) of 92 simple correlations of home environment and learning are .37 (and .02 to .82) and of 62 multiple-regression-weighted composites are .44 (and .23 to .81). Jacknifed regression estimates indicate that the gender and SES of the sample condition the sizes of the correlations and suggest priorities for future primary investigations.

Home Environment and Learning: A Quantitative Synthesis

The social and psychological stimulation of the child's academic development by parents or other significant persons in the home environment appears to be an important influence on academic ability, achievement, and motivation (Freeberg & Payne, 1967; Walberg & Majoribanks, 1976; Cicirelli, 1978; and Marjoribanks, 1979); but the research has not been quantitatively synthesized to show the average relation between measures of home environment and learning and to answer such questions as: What aspects of the home environment are most predictive of learning? What aspects of learning and psychological development are most predictable from home environment? And how do such predictions vary across sample characteristics such as age, sex, and nationality of students, and across theoretical and methodological approaches to research on home environments? Drawing on the work of Gage (1978), Light and Smith (1971), and Rosenthal (1976) as well as his own substantive work on class size and psychotherapy in collaboration with Smith, Glass (1978) reviews quantitative techniques for research synthesis. Our purposes are to provide a quantitative summary of the research and answers to these and other questions by using statistical techniques

developed by Glass (1978) to consolidate diverse studies within a research domain.

Theoretical Background

For historical and theoretical perspective, four approaches to the measurement and study of home environments in relation to academic learning may be distinguished: 1) sociological surveys that include socio-economic measures such as parental education, income, and occupation; 2) family-constellation studies that analyze the number, birth order, and spacing of children in the family; 3) the work of the "British school" that emphasizes parental experiences and aspiration for the child, and objects and material conditions in the home; and 4) the work of the "Chicago school" that emphasizes specific social-psychological or behavioral processes thought condusive to learning. These four approaches by no means represent opposing views but do constitute fairly distinctive and somewhat separate research traditions. Although the present synthesis concerns the British and Chicago schools, recent systematic reviews of sociological and family-constellation studies deserve brief discussion.

White (1976) analyzed 636 correlations from 100 studies of socio-economic status (SES) indexes with academic achievement. His work shows that on average income is a better predictor of achievement (.31) than are education

and occupation (.19 and .20 respectively), and that verbal achievement is better predicted from SES indexes than is mathematics achievement (.24 and .19).

Research on family constellation also shows low predictability of learning. The typical correlation of the number of children in the family ("sibsize") with academic achievement is .25 (Walberg and Marjoribanks, 1976; and Cicirelli, 1978). With very large samples, birth-order and spacing are significant correlates of achievement in some work; but their correlations with learning are considerably smaller and more unstable than those involving SES and sibsize.

Reviews of recent research suggest that SES and family-constellation variables require simultaneous analysis and that a plausible non-linear function of sibsize provides better predictability (Walberg & Marjoribanks, 1976; Cicirelli, 1978). Anastasi's (1956) early contention that lower achievement is more strongly associated with large sibsizes in lower SES families than in higher SES families is consistently supported; thus, the differences in ability and achievement between children from large and small middle-class families are small compared to the size differences in lower-SES families. Moreover, it is reasonable to imagine that, other things being equal, an only child receives 100 percent of the parental

attention devoted to the sibling group; two children each receive 50 percent; three children, 33 percent, and so on. Recent research suggests that the inverses of sibsize, that is, 1/1, 1/2, 1/3, and so on, provide a better prediction of learning (Walberg & Marjoribanks, 1976; Cicirelli, 1978).

By the standards of predictive validity and psychological theory, however, family SES and constellation are less valid, but also less expensive proxies for aspirations, conditions, and processes in the home that are conducive to learning. Walberg and Marjoribanks (1976) and Marjoribanks (1979) review several studies that show that regression-weighted composites of home-interview measures of parental characteristics and behavior correlate up to .80 with verbal achievement measures. These reviews also show that SES is only weakly to moderately associated with measures of the home environment. Thus, less than half but a substantial fraction of the children from lower-SES families are in relatively stimulating home environments; the fraction is considerably smaller, however, in large, lower-SES families.

Majoribanks (1979) distinguished the "Chicago" and "British" schools of research on home environments. In dissertations directed by Benjamin Bloom (1964) at the University of Chicago, Dave (1963) and Wolf (1964) developed lists of parental behaviors and parent-child interactive

behaviors that seemed likely to foster intellectual growth. These "process" variables are specific and changeable; and ratings of them are made by trained home interviewers who ask such questions as: "Do you read to the child?" "To which museums have you taken the child?" and "Who plans family vacations?" Sets of process variables are summed to provide indexes of "presses" in the home environment; for example, Dave and Wolf assessed six presses: academic guidance, achievement, activeness of family, intellectuality of the home, work habits of the family, and language models, all of which were hypothesized as important influences on academic achievement. Research following the "Chicago" school since Dave and Wolf focused on the presses for academic guidance, achievement (both for the child and parent) and activeness of the family because these aspects of home environment seem most readily influenced by intervention programs (Dolan, 1978). The other presses, language models and intellectuality seem less changeable, involve parent status more than behavior, seem less closely associated with achievement, and are therefore not measured in later Chicago studies (Marjoribanks, 1972; Kifer, 1975).

Studies within the British school also attempt to develop valid measures of the home environment (Fraser, 1959; Peaker, 1967; Wiseman, 1967; Marjoribanks, 1967; Claeys

& DeBoerk, 1976; Schaefer, 1976) but they focus on parental experiences and attitudes, and material conditions in the home rather than on behavioral processes (Marjoribanks, 1979). These studies use a variety of home assessment measures such as "The Survey of Parents of Primary-School Children" (Plowden, et al, 1967). Typical questions include: "What do you feel about the ways teachers control the children at (present school)?" and "Has the head teacher, or any other teacher talked to you about the methods they use at (present school)?" Such questions focus on parent attitudes and experiences rather than directly on parental practices. Fraser (1959), who used reading habits of the parents as a home environment measure, and Claeys and DeBoerk (1976) and Schaefer (1976), who used the Parent Attitude Research Instrument (Schaefer, 1958) as a home environment measure, classify as studies within the British school (see Table 1). Studies by Kifer (1975), Shea (1977) and Marjoribanks (1972 and 1976) used modified versions of the Index of Educational Environment (Dave, 1963), therefore they are considered Chicago school. Other Chicago studies include Wolf (1964), Dyer (1967), Mosychick (1969), Weiss (1969), Keeves (1972), Kellaghan (1977) Marjoribanks (1978), and Dolan (1978). In addition to the purposes of the present study stated in the opening paragraph--to provide an estimate of the mean correlation of home environment with learning measures across studies

as well as indications of sample and study characteristics associated with different magnitudes of the correlation, an effort was made to determine if the Chicago and British studies differ in their predictive validity.

Method

Study Selection

The 13 references in a recent review by Marjoribanks (1979) were the starting points for searching for home environment studies. A search was made of the journal Child Development for the years 1976 through 1978, the Social Science Citation Index for studies published in 1976 through 1977 that cited earlier work, the Educational Resources Information Center (ERIC) under the descriptors "family environment" and "family influence," and the references in recent research. All 18 studies that reported simple or multiple correlations of home environment with ability, achievement, or motivation measures for school-age (first- through twelfth- grade) samples were selected for analysis. The characteristics of the studies are shown in Table 1.

Insert Table 1 about here

Coding and Analysis

Eight items of information were recorded for each correlation: the size, age, sex, and socioeconomic status of the sample; the home-assessment and learning measures employed; Chicago or British school; and type of correlation (Table 2). Several coding procedures require comment. Since some studies grouped boys and girls in

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Insert Table 2 about here.

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calculating correlations, and others separated them, three coding categories for sex--boys, girls, and mixed--were employed. Since a considerable number of studies employed Dave (1963) and Wolf's (1964) Index of Educational Environment or Schaefer's (1958) Parent Attitude Research Instrument (Table 2), correlations involving these instruments were coded to determine their distinctive predictive validities.

In the analyses of variance, the eight factors were employed as nominal variables as grouped and indicated in Table 2. In the regressions, however, the continuous variables, age and sample size, were left in their full metric percision without grouping; and the nominal factors were recoded to sets of binary (0,1) variables to assess the possible effect of the value of each nominal factor

on the correlation.

Since the number of correlations varies among studies, studies with greater numbers of correlations would be weighted more heavily than others if each correlation were to be given equal weight. To give each study equal weight in the regressions, each correlation was given a weight inversely proportional to the total number of correlations from the study from which it was taken; for example, Fraser's (1959) six correlations each received a weight of 1/6.

Although weighted regressions weight each study equally, they do not remove statistical dependencies among the correlations within each study that violate inferential assumptions. The jacknife procedure (credited by Glass, 1978, to Tukey's personal communication) was employed, as explained below, to provide stringent, independent estimates of the regression coefficients and their standard errors.

Results and Discussion

Table 1 shows the chief characteristics of the samples and methodologies of the 18 studies that resulted from the search and selection procedures. The samples range in size from 15 to 3,092; and the grand total across studies is 5,831. There are 94 simple correlations with a median of .37 and a range from .02 to .82 and 62 multiple correlations with a median of .44 and a range from .23 to .81 .

Table 2 shows the univariate, correlation-weighted comparisons for each of the eight factors on correlations of learning with simple indexes and multiple regression-

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Insert Table 2 about here

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weighted composite indexes of home environment. The sizes of the multiple correlations are significantly related to: socioeconomic status, type of learning criterion measure, sample size, age and home measure. For simple correlations, learning criterion measure, SES, age, school and nationality showed significant differences. These univariate statistics show the numbers and patterns of correlations for study and sample characteristics, but weight the studies unequally, yield dependent estimates, and do not control the factors for one another.

A series of regressions was planned to remove these shortcomings (Table 3). From a study-weighted regression

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Insert Table 3 about here

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of the correlations on the complete set of 25 variables (the two continuous variables and the 23 binary-coded

factors), those with t values less than one were first deleted from regressions since they make no independent contribution to the accountable variance. The next regression deleted variables with t values less than 2, which are below the approximate .05 significance level, (shown in the second double column of figures in Table 3). As a matter of methodological interest, a correlation-weighted regression was run on the reduced set (shown in the first double column of Table 3). The third column of figures in Table 3 shows the jacknifed regression weights and t values which control for dependence among the correlations within each study.

The first two double columns of Table 3 show that alternative weighting of either correlations or studies makes little difference in the magnitudes of the metric regression weights and their t values, all eight of which are significant at the .05 level with either weighting on 150 degrees of freedom. Although it increases the accountable variance (R^2) somewhat, jacknifing (shown in the third double column) reduces four of the eight t values below conventional significance levels on 17 degrees of freedom (the number of studies minus one). The reductions on the t values by jacknifing indicate that on correlations in a particular study are raised or lowered on average by measurement, sample, or other characteristics common to the study. The stringent jacknifed estimates are preferable to the

others because they validly assume that there are only 18 independent items of information rather than 154 even though correlations are calculated on samples of dozens or hundreds of students in each study that sum to more than 5,000.

The jacknifed equation shows that correlations with specified characteristics are significantly different than others, namely, that those calculated separately for boys (probability less than .05) and girls (.10) and middle-class samples (.10) and those based on multiple-regression-weighted composites of home environment (.05) measures are higher than correlations without these characteristics. Because their t values are greater than one, the other four variables contribute uniquely to the accountable variance but are not significant; the weights for these variables indicate tendencies for older samples and Chicago studies to yield higher correlations, and for correlations of home environment with intelligence and motivation to be lower than those with achievement measures.

The sizes of the metric regression weights in addition to their statistical significance levels require consideration. For example, even though the type of correlation is significant, multiple correlations are on average only .029 higher than simple correlations which indicates a single index of an aspect of home environment correlates

only slightly less closely on average with learning measures than do multiple-regression-weighted composites of indexes up to six aspects; thus the home environment indexes share a great deal of common, overlapping variance with one another. On the other hand, even though age is not significant, the difference in average estimated correlations across the age range of the samples, 6 through 18 years, (18-6).026 = .31, is substantial; and, if the trend is confirmed in future empirical research, it would suggest cummulating effects, mutual reinforcement, or mutual dependency of the home environment and learning during the school years.

Since the correlations for boys and girls are higher than those for mixed samples, the sexes differ either in average parental stimulation to which they are exposed in the home environment, or in the regression slope of dependency of learning on such stimulation, or both. Reporting regression constants and weights for the sexes separately would produce evidence on these interesting and important explanations, which cannot be adjudicated on the basis of separate correlations for boys and girls.

The jacknifed regression equation accounts for a sizeable amount of the variance in the correlations, 72 percent, and the weights may be used to estimate the sizes of the correlation to be expected in future data sets. For example the estimate of the correlation of

a single environment scale with achievement for twelve-year-old boys or girls of mixed socio-economic status is .48 and is calculated by adding the constant, twelve times the weight for age, and either the weight for boys or the weight for girls which are about the same. Relatively confident estimates from the jacknifed equation can be interpolated within the combinations of values of the sample and study characteristics that have been more frequently investigated as shown in Tables 1 and 2. Extrapolations beyond the range of these combinations, however, may have wide margins of error. The non-significant weights in the equation suggest priorities for future correlational research on home environments to improve the estimates and to provide confirmation or refutation of such trends as younger samples and motivation measures yielding lower correlations.

Educational policy and practical implications for parental stimulation of their children, however, would be better founded on experimental investigations than on continued correlational studies. Two quasi-experimental field tests of school-based home enrichment programs, for example, suggest that children in impoverished urban areas can make reading gains comparable to those of middle-class children under certain conditions (Marjoribanks, 1979). More research along this line is obviously in order.

Table 1

Characteristics of 18 Studies

Identification		Sample Characteristics				Instruments		School	Type and Range of correlation	
Author	Date	N	Sex	Age	Locale	Home	Criterion			
Fraser	1959	427	N.S.[a]	12-15	Scotland	Observation of home Parent reading habits Parent Attitudes	Intelligence test Combined assessment of Secondary performance	British	R	.28 to .46
Davé	1963	32 28	girls boys	10-11	Illinois	Index of Educational Environment (IEE)	Metropolitan Achievement battery Henmon-Nelson Intelligence	Chicago	r R	.55 to .82 .56 to .80
Wolf (same sample as Davé)	1964	32 28	girls boys	10-11	Illinois	IEE	Henmon-Nelson Intelligence	Chicago	R	.70

Table 1 continued

Dyer	1967	15 15	girls boys	11	Port of Spain, Trinidad	IEE	Iowa Test of Basic Skills Lang-Thorndike IQ test	Chicago	R	.32 to .78
Wiseman	1967	186	Mixed	7-10	Manchester, England	Survey of Parents of Primary School Children (SPPSC) (devised for the Plowden survey)	A range of tests which varied by age, including Mechanical arithmetic, English/ vocabulary, Total Intelligence (a sum of several tests)	British	r R	.22 to .39 .27 to .42
Peaker	1967	3,092	Mixed	11	England-national sample	SPPSC	Reading scores - a sum of several year's scores	British	r R	.20 to .59 .55 to .70
Mosychuk	1967	100	Boys	11	So. Ontario, Canada	IEE	WISC	Chicago	R	.32 to .42

Table 1 continued

Weiss	1969	28 girls 27 boys		11	Illinois	IEE	Achievement rating Self-esteem rating by teacher by self	Chicago	R	.65 to .81
Keeves	1972	215	N.S.	11-12	Australia	IEE	Math achievement Science achievement Academic Self-concept	Chicago	R	.24 to .58
Marjoribanks	1972	185	boys	11	So. Ontario, Canada	IEE	SRA Primary Abilities Otis Intermediate IQ	Chicago	r R	.04 to .69 .33 to .72
Kifer	1972	214	Mixed	8-12	N.S.	IEE (Modified 15 question version called Home concern)	Coopersmith Self-concept Brookover Self-esteem Intellectual Achievement Responsibility (IAR)	Chicago	r	.01 to .53

Table 1 continued

Marjoribanks	1976	396 girls 383 boys	11-15	England	SPPSC	Intelligence Alice Heim) English(Watts-Vernon) Math (Watts-Vernon) Aspirations (NFER) Locus of control (NFER)	British	r R	.49 .29 to .50
Claeys & DeBoerk (all children were adoptees)	1976	36 girls 33 boys	5-7	Leuven, Belguim	Parent Attitude Research Instrument (PARI) Life Goals Inventory	Thurstone PMA Child's embedded figures test (CEFT)	British	r	.02 to .23
Kellaghan (low SES)	1977	30 girls 30 boys	8	Dublin, Ireland	IEE	Stanford-Binet Arithmetic Quotient Reading Quotient	Chicago	r	.47 to .53

Table 1 continued

Schaefer	1977	212	N.S	5	No.Carolina	PARI	T.O.B.E. reading math	British	r	.17 to .48
Shea	1977	153	N.S.	5-8	Urban N.E. city Rural S.W. city	Home Environment (HER-a modified IEE)	Metropolitan Achievement Test-total reading California Achievement test-vocabulary comprehension		R	.23 to .40
Marjoribanks	1978	550	Mixed	Australia		IEE (modified by Marjoribanks)	Otis intermediate Barker-Lunn and Sumner affective measure	Chicago	R	.33 to .44
Dolan	1978	243	9-11	mixed	Chicago	Dolan questionnaire (modified IEE)	Brookover Crandall Individual Achievement Responsibility (IAR)			

[a]N.S. = not specified

Table 2

Univariate Statistics for Simple and Multiple Correlations

Variables	Multiple Correlations				Simple Correlations			
	$\bar{X}$	S	N	F (p)	$\bar{X}$	S	N	F (p)
Sex								
Boys	.54	.18	17	1.87(.16)	.36	.21	17	.06(.95)
Girls	.52	.19	13		.36	.18	16	
Mixed	.45	.18	33		.38	.17	59	
Socioeconomic Status								
Lower	.65	.19	2	6.35(.00)	.33	.18	45	24.29(.00)
Middle	.65	.14	9		.71	.09	8	
Unspecified	.45	.17	51		.35	.11	39	
Home Measure								
Dave IEE[a]	.60	.18	28	30.4(.00)	.54	.13	33	51.35(.00)
Schaefer PARI[b]		--	--		.19	.13	16	
Other	.39	.13	35		.31	.11	43	
Learning Measure								
Language	.68	.00	1	6.05(.00)	.52	.23	2	4.06(.00)
Reading	.40	.22	4		.57	.08	8	
Arithmetic	.55	.11	8		.36	.17	22	
Total Achievement	.59	.17	15		.42	.19	22	
Intelligence	.36	.14	8		--	--	--	
IQ	.41	.06	10		.29	.17	18	
Motivation	.64	.20	9		.29	.14	18	
Other	.49	.07	7		.40	.12	2	

Table 2 continued

Chicago School	.52	.20	38	4.37(.04)	.46	.18	44	24.66(.00)
British School	.43	.13	25		.29	.13	48	
Sample size								
0-99	.68	.12	18	29.41(.00)	.42	.22	43	4.24(0.2)
100-299	.38	.14	22		.30	.12	31	
300 and above[c]	.44	.13	22		.38	.12	18	
Age								
5-8	.30	.06	10	27.90(.00)	.20	.13	18	13.36(.00)
9-11	.62	.16	29		.41	.17	66	
12-15	.41	.12	19		.41	.15	8	
Nationality								
USA	.54	.22	24	2.51(.03)	.37	.22	36	10.85(.00)
Australia	.39	.11	7					
England	.46	.14	18		.34	.10	32	
Ireland					.51	.04	18	
Scotland	.35	.07	7					
Canada	.62	.17	3					
Belguim					.11	.08	6	
Trinidad	.57	.20	4					

[a]IEE Index of Educational Environment

[b]PARI Parent Attitude Research Instrument

[c]For the class interval "300 and above", the sample sizes are: 427, 550, 779 and 3,092; see Table 1

Table 3

Three Regression Models

Variable	Correlation-Weighted b(T) (1)	Study-Weighted b(T) (2)	Study Weighted, Jacknifed b(T) (3)
Age	.025(4.7)	.026(5.0)	.026(1.4)
Boys	.077(2.7)	.096(3.4)	.114(2.1)
Girls	.068(2.2)	.094(3.3)	.109(2.0)
Middle SES	.231(6.1)	.184(5.5)	.478(1.8)
Chicago	.132(4.6)	.184(7.4)	.242(1.2)
Intelligence	-.151(3.0)	-.174(3.1)	-.138(1.4)
Motivation	-.091(2.6)	-.164(5.0)	-.266(1.1)
Multiple	.055(2.3)	.044(2.0)	.029(2.6)
Constant	.041	.031	.057
R^2	.545	.661	.721

Note: Jacknifed T-values of 1.7 and 2.1 are respectively significant at the .10 and .05 levels.

References

Anastasi, A. Intelligence and family size. Psychological Bulletin, 1956, 53, 187-209.

Bloom, B. S. Stability and change in human characteristics, New York: Wiley, 1964.

Cicirelli, Victor G. The relationship of sibling structure to intellectual abilities and achievement. Review of Educational Research, 1978, 48 (3), 365-379.

Claeys, W. & DeBoerk, P. "The influence of some parental characteristics on children's primary abilities and field independence: A study of adopted children". Child Development, 1976, 47, 842-845.

Dave, R. The identification and measurement of environmental process variables that are related to educational achievement. Unpublished doctoral dissertation, University of Chicago, 1963.

Dolan, Lawrence. The affective consequences of home support, instructional quality, and achievement. Urban Education, 1978, 13(3), 323-343.

Freeburg, Norman E. & Payne, Donald T. Dimensions of parental practice concerned with cognitive development in the preschool child. The Journal of Genetic Psychology, 1967, 111, 245-261.

Gage, N. L. The scientific basis of the art of teaching. New York: Teachers College Press, 1978.

Glass, G. V. Integrating findings: the meta-analysis of research. In L. S. Shulman (Ed.), Review of Research in Education, Vol. 5, Itasca: Peacock, 1978.

Kellaghan, T. Relationships between home environment and scholastic behavior in a disadvantaged population. Journal of Educational Psychology, 1977, 69, 754-760.

Keeves, J. P. Educational Environment and Student Achievement. Stockholm: Almquist & Wiksell, 1972.

Kifer, E. Relationships between academic achievement and personality characteristics: A quasi-longitudinal study, American Educational Research Journal, 1975, 12, 191-210.

Light, R. V. and Smith, P. V. Accumulating evidence: procedures for resolving contradictions among different research studies. Harvard Educational Review, 1971, 41, 421-471.

Marjoribanks, K. Environments for learning. Slough: England NFER Publishing Co. 1974.

Marjoribanks, K. Family environments: Relations with children's cognitive performance and affective performance. In H. J. Walberg's Learning environments and effects. Chicago: National Society for Study of Education, 1979.

Miller, G. W. Educational opportunity and the home. London: Longman Group Limited, 1971.

Peaker, G. The regression analyses of the national survey. In B. Plowden (Ed.) et al., Children in their primary schools. London: H. M. Stationery Office, 1967.

Plowden, B. (Ed.) et al., Children in their primary schools. London: H. M. Stationery Office, 1967.

Rosenthal, R. Experimenter effects in behavioral research. New York: Irvington Publishers, 1976.

Schaefer, E. & Clark, P. Parent-professional child interaction & involvement. A paper presented at Teacher Corps Conference at Michigan State University, 1977.

Shea, J. & Hanes, M. The relationship between measures of home environment and school achievement of Follow Through Children. Gainsville, Fla. University of Florida, 1977 (ERIC Document Reproduction Service No. ED 013 371).

Walberg H. J. and Marjoribanks, K. Family Environment and Cognitive Devleopment: Twelve Analytic Models. Review of Educational Research, 1976, 46, (4), 527-551.

Weiss, J. The identification and measurement of home environment factors related to achievement motivation and self-esteem. In K. Marjoribanks (Ed.) Environments for Learning. Slough, England: NFER Publishing Co., 1974, 141-149.

White, K. R. The relationship between socioeconomic states and academic achievement. Unpublished dissertation. University of Colorado, 1976.

Williams, Trevor. Abilities and environments. In W. H. Sewell, R. M. Hauser & D. L. Featherman (Eds.), Schooling and achievement in American society. New York: Academic Press, 1976.

Wiseman, S. The Manchester Survey, Appendix G. In Children and their Primary Schools (Vol. 2) Research and Surveys. London, England: H. M. Stationery Office, 1967.